



Case report

Child starvation and neglect: A report of two fatal cases

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ABSTRACT

Fatal starvation is a rare cause of death in industrialised countries. In such cases, investigation of death is never an easy task for forensic pathologists who need to couple autopsy findings with full investigation of the crime scene and family record to establish if death results from deliberate neglect, maltreatment and withholding of food. The present article describes two cases of death caused by child neglect. The first case involved a 16-month-old female who died from starvation with dehydration as a contributing factor. In the second case a 7-year-old girl died from ultimate aspiration of stomach contents that had been vomited during the child's last meal because of the fecal concretions blocking the intestinal passage. In both cases macroscopic and histological findings revealed severe chronic malnutrition; crime scene investigations confirmed stories of child maltreatment and neglect.

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1. Introduction

Child abuse and neglect are widespread problems found all over the world and have received considerable publicity over the past three decades.^{1–4} Even though there are many articles focussing on child deaths due to physical maltreatment, lethal neglect resulting from malnutrition, dehydration and failure to provide child medical care remain a relatively uncommon and not well-identifiable cause of death in industrialised countries.^{5–10} We report two fatal cases where a complete forensic investigation revealed stories of child starvation, maltreatment and total neglect.

2. Case 1

A 16-month-old female was brought to the Emergency Room by her stepfather who said that he had found her at home, sitting in a stroller unconscious. Attempts at resuscitation were unsuccessful and the physicians established her cachectic state and multiple bruises located about the entire body. The child's mother stated she was dead on arrival noting she had not been "eating well" that week.

The autopsy revealed the child weighed 5.7 kg and was 76 cm long, corresponding to a value less than the third percentile.¹¹ She was severely dehydrated showing prominent skeletal prominences due to the severe depletion of the muscles of her face, trunk and extremities as well as the inelasticity of skin over the whole body (Fig. 1). The atrophy of orbital adipose tissue showed sunken eyes. Examination of the head revealed multiple abrasions and ecchymoses at varying healing stages; there were also focal areas of alopecia. Incised and multiple stab-type wounds were present on the left auricle and on the neck. There were bruises located on the chest and on the upper extremities; the left forearm X-ray showed an extensive periosteal reaction secondary to a healing subperiosteal haematoma (old fracture) corresponding to an old contusion of the arm (Fig. 2). Multiple superficial excoriations were present on the upper back, lumbar area and pelvis.

The thymus was atrophied. The stomach and large intestine were empty and exhibited some ulcerative lesions; there were nearly 15 g of faeces in the rectum. The weights of most of the child's organs were markedly less than normal averages being reduced by 20–50% compared to standard organ weights of a 16-month-old baby.

Histological study revealed focal acute hypostatic bronchopneumonia, massive oedema of the brain, hepatic steatosis and no glycogen in the liver on Periodic-acid Schiff (PAS) stain. Pre-existing diseases (e.g., malabsorption and cancer) were definitively excluded.

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Fig. 1. View of the victim in the supine position. Prominent bones and wrinkled skin can be seen.

The cause of death was listed as starvation with dehydration as a contributing factor.

The child lived in a reconstituted family. The mother did not work but she occasionally prostituted herself to earn money; her present partner had a history of alcohol abuse and a previous conviction for theft. The victim was the result of a short-lived relationship between her mother and a man who left her soon after she became pregnant. She lives, with children the mother had with the present husband, in a 40 m² house in a suburban area in south-eastern Italy. At the time of the child's death, the other children were found to be healthy and well nourished. The victim had never received any medical examinations, even though it is obligatory in Italy. A forensic psychiatric evaluation was conducted on the parents and no psychiatric disorders were found.

Home inspection revealed the victim had spent all her time sitting in a stroller located in the parent's bedroom, facing the wall. The parents confessed that they fed her intermittently with water and sugar, small portions of milk occasionally adding breadcrumbs. Sometimes she ate leftover food from the other children. When the victim cried because she was hungry, the "caregivers" would throw objects at her head (baby-bottles, toys, etc.) from their bed or they would beat her with a metal spoon. To stop her from crying, they sometimes played a game that they called 'record-player': the parents took her by the arms and spun her so quickly until she lost consciousness, resulting in injuries to her forearms.

After trial proceedings, the parents were convicted of homicide and sentenced to 30 years in prison.



Fig. 2. Left forearm X-ray: extensive periosteal reaction secondary to healing of subperiosteal haematoma surrounding old forearm's fracture.

3. Case 2

A 7-year-old girl was found dead at home. Her parents had called an emergency physician who found a completely emaciated child lying dead in her parents' bedroom. Since the girl, who still wore diapers at the age of 7 years, was evidently in a state of extreme malnutrition, the emergency physician notified the police. According to the mother's statement, the girl had received a chicken meal on the evening before she died.

Gross examination of the body revealed that the child was severely emaciated and malnourished with a body weight of 9.6 kg and a height of 105 cm (Fig. 3). Due to severe anaemia, no lividity was apparent at external examination. Apart from extreme dehydration (Fig. 4), there was a complete loss of the subcutaneous and visceral adipose tissue (Fig. 5) as well as extreme muscular atrophy. Autopsy findings revealed the large intestine was completely obstructed by faecal concretions (weight of concretions: 870 g). Within the trachea and bronchi, there was abundant brown liquid corresponding to stomach contents. In addition, a purulent pyelonephritis was found in both kidneys. The organ weights as determined at autopsy were reduced by 10–60% compared to standard organ weights of a 7-year-old girl.

According to the extreme underweight and bodily dehydration, the ultimate cause of death was aspiration of stomach contents that had been vomited during the child's last meal because of the faecal concretions blocking the intestinal passage. This phenomenon was indeed related to the cause of death that was due to child's dehydration and starvation that contribute both to inability to respond to food intake aspiration and intestinal obstruction.

Histology confirmed the macroscopic diagnosis of massive aspiration of stomach contents. Identified food constituents corresponded to the last meal the girl had received from her mother on the evening before she died (Fig. 6). Microscopic findings were consistent with the gross findings, and ruled out evidence of prior conditions, including other causes for malabsorption. Bone histology showed advanced rickets with numerous resorption lacunae and osteoclasts (Fig. 7).

Postmortem radiological examinations showed no evidence of osseous injuries due to trauma. However, the skeletal age corresponded to the standard radiological age of a 3-year-old girl.

A thorough toxicological examination of blood, body fluids and organs was negative as to drugs, narcotics or any other toxic substances.

Postmortem biochemical examination revealed 212 mg dl⁻¹ urea content within vitreous humour.



Fig. 3. The body at external examination before autopsy.



Fig. 4. Postmortem finding of extreme exsiccosis: when pinched up between the fingers, skin folds on the upper arm remained elevated and did not return to their flat position.

According to police investigations, the girl had spent most of her life in a darkened room with black foil taped over the windows. Locked up like a caged animal, she was totally neglected, dirty, hungry and without any toys. Her parents often left her all alone and gave her hardly anything to eat. As she regressed steadily, she finally weighed only 9.6 kg.

The parents were convicted of murder and sentenced to life imprisonment from the trial that ensued.



Fig. 5. Complete loss of the visceral adipose tissue.

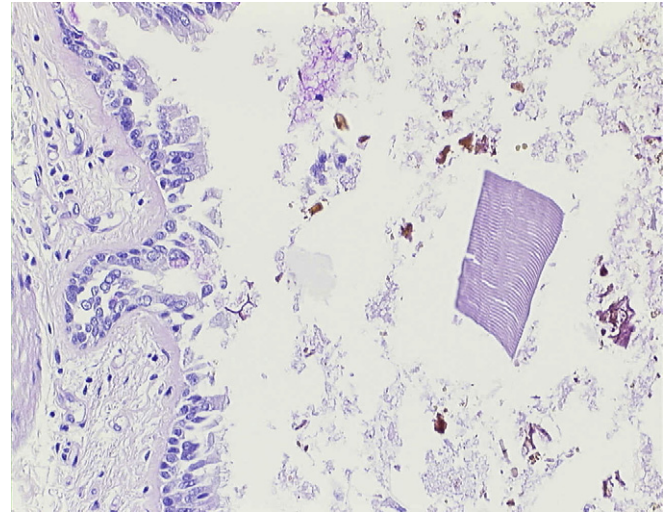


Fig. 6. Lung histology. Aspirated food constituents corresponding to meat fibres (PAS).

4. Discussion

Although neglect is the most common form of child maltreatment, few articles have been published in the medical literature focussing on lethal neglect. Child neglect can be defined as the failure of a caregiver to provide for a child's necessities of basic life, including physical safety and protection, food, hydration, clothing, shelter and medical care.^{4,9,12,13} Failure to fulfil these responsibilities may constitute active or passive neglect.

Deliberate starvation of an infant or child is a severe form of child abuse, even though it is very uncommon and rare, especially in industrialised countries.¹⁴ In such cases, investigation of death is never an easy task for forensic pathologists; thus, forensic investigation requires thorough autopsy findings, full investigation of the crime scene and a case history including past medical records, family history and social background.^{8,12,15,16}

The findings in our cases clearly fulfilled these steps of investigation.

Firstly, macroscopic findings revealed that in both cases the body measurements were indicative of severe chronic malnutrition (highest severity grade) according to the Waterlow Classification, a system commonly used in this connection^{17,18} (Table 1). The

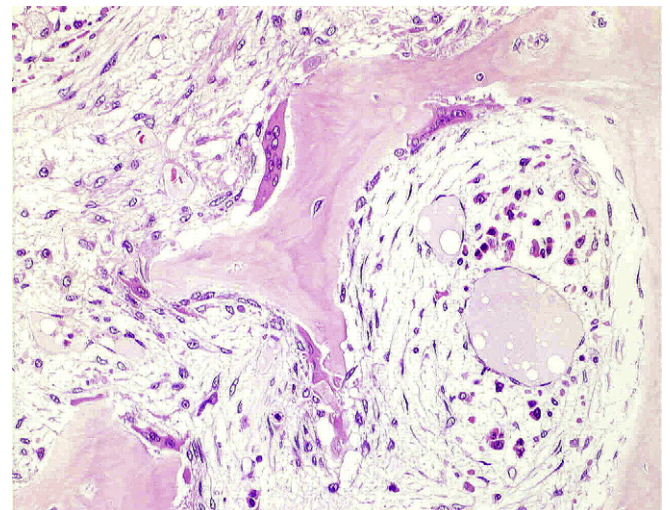


Fig. 7. Bone histology. Resorption lacunae and osteoclasts (HE).

Table 1
Waterlow classification of malnutrition.

Expected weight for length	Degree of malnutrition
90% or more	Normal, no malnutrition
80–89%	Mild malnutrition
70–79%	Moderate malnutrition
70 or less%	Severe malnutrition

Table 2
Malnutrition/starvation common autopsy findings.

External findings	Autopsy findings	Microscopic findings
Sunken orbits	Decreased organ weight	Pulmonary aspiration
Skin tenting	Thymus involution	Acute bronchopneumonia
Focal alopecia	Stomach and small bowel empty	Hepatic steatosis
Muscle atrophy	Colon dry faecal material	Absent liver glycogen
Loss subcutaneous adipose tissue	Gallbladder distended	Brain oedema
Prominent ribs	Brain oedema	Bone rickets

normal height and weight for a 16-month-female is in the range of 75–84 cm and 10.5–12 kg, respectively, and the normal range for a 7-year-old girl is 114–133 cm and a weight of between 17 and 30 kg, according to the grading for protein energy malnutrition charts.¹⁹ Therefore, in both cases the body weights were only 49–51% of these reference values; no chronic diseases, which may have contributed to her malnourishment or dehydration, were found.^{11,20–23} Moreover, all other macroscopic findings and autopsy findings were indicative of chronic lack of care^{24–28} (Table 2).

In the first case, the combination of starvation and severe form of physical abuse was observed. More than 50 ecchymoses at various stages of healing, together with six incised wounds and an old fracture were found on the body. All of these data and the manner in which these injuries were inflicted on the infant were later confirmed by the parents and revealed that a false statement by the mother, which was intended to hide a story of parental rejection and child torture, had been made.

In the second case, the absurd paradox was that the starved child choked to death on her last meal. This event was due to aspiration of stomach contents because of the faecal concretions blocking the intestinal passage; this phenomenon was indeed related to child's dehydration and starvation.

A condition of total neglect towards the child was confirmed by the severe ascending purulent pyelonephritis that can be ascribed to the unhygienic conditions endured by the child, who wore filthy diapers (at the age of 7 years!) and therefore was extremely dirty in the anogenital region. The bone histology showed advanced rickets with numerous resorption lacunae and osteoclasts. This finding can be attributed from the postmortem viewpoint to the girl receiving an inadequate supply of vitamins (including vitamin D) and living in constant darkness (no UV light exposure). The urea content of the vitreous humour with 212 mg dl⁻¹ corresponds to the so-called 'dehydration pattern'.^{29,30} This was caused by the extreme bodily dehydration and entirely inadequate fluid supply during life.

These case reports once again demonstrate that a careful medico-legal approach is vital to the investigation of lethal child neglect. The forensic pathologist's role is often critical but we must remember that crime scene and family investigations are just as important as autopsy findings.

Conflict of interest

The authors have not conflict of interest.

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Ethical approval

No ethical approval is required.

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